INERTIAL CONFINEMENT FUSION
Lawrence Livermore National Laboratory

Monthly Highlights

December 1998

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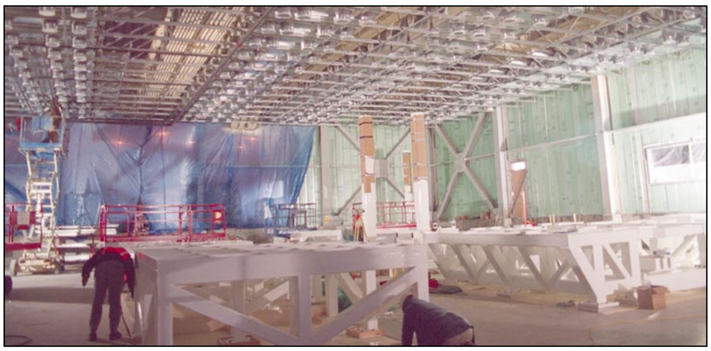
NIF Optics Assembly Building Special Equipment Installed.

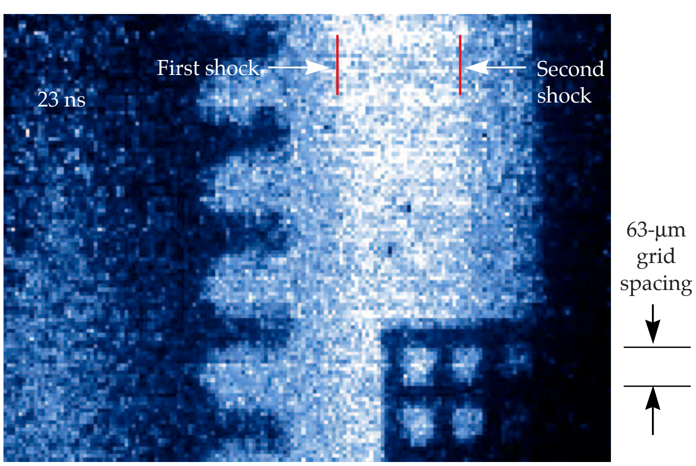
The initial installation of Optics Assembly Building (OAB) Special Equipment was completed in November in parallel with ongoing construction. The OAB will be used for the clean assembly of optics and line-replaceable units. The equipment installed included the support structures for the assembly and alignment equipment, the two Laser Bay transporter vertical lifts, spatial filter tower vertical lift, and the clean-room jib cranes.



The initial NIF OAB special equipment has been installed.

A Novel Double-Shock Experiment on Nova.

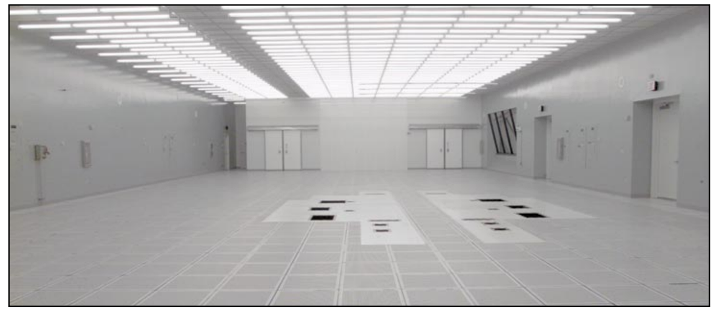
We have begun to investigate hydrodynamic instabilities in doubly shocked systems. A half-hohlraum driver launches a shock into a miniature shock tube across a rippled interface, causing the ripples to grow via the Richtmyer–Meshkov instability. A second, counterpropagating shock launched from the opposite end of the shock tube by a second half-hohlraum driver will impact the developing mix region. The figure below shows ripple growth after passage of the first shock. The second shock has not yet impacted the perturbed interface. Future experiments viewing later in time will observe the effect of the second, counterpropagating shock on instability growth.



X-ray image from the 2SHOCK experiment at 23 ns.

Beneficial Occupancy of Optics Processing R&D Area.

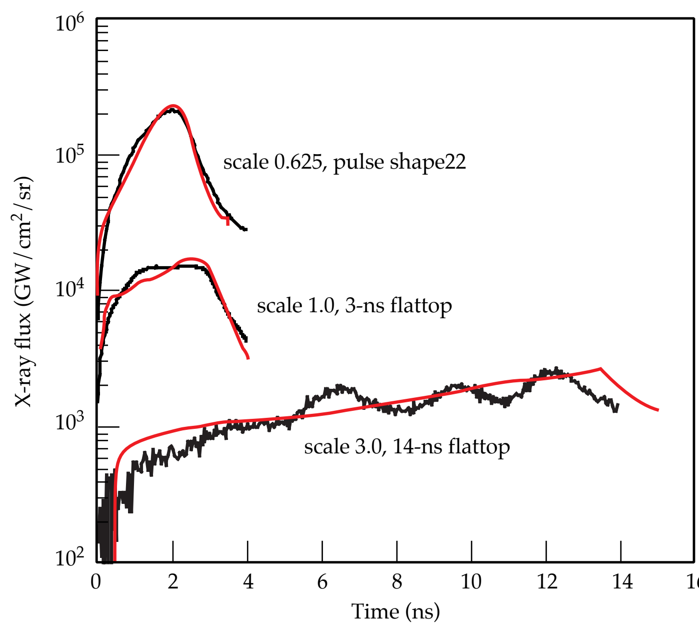
Construction of the first phase of the Optics Processing R&D Area (OPRDA) was completed in November. This clean room will house the precision cleaning and sol-gel antireflection-coating equipment for processing the NIF's large glass optics. These optics include laser glass, fused silica lenses and windows, and mirrors and polarizers.



The OPRDA is ready for occupancy.

X-Ray Drive Characterization.

We have successfully predicted x-ray drive from Nova experiments in a variety of hohlraums. These experiments, some performed in collaboration with the French Atomic Energy Commission (CEA), produce varying drive conditions—from those in the initial low-intensity part to those approaching the high-intensity part of the NIF pulse. LASNEX has modeled the x-ray flux based on absorbed laser power to an accuracy of 4±12%, as shown in the figure, giving us confidence in our predictions for ignition drive conditions for the NIF.



Experimental (black) and simulated (red) x-ray flux from the hohlraum wall in three extreme hohlraums show excellent agreement.

For comments about content of the *Monthly Highlights*, contact Bob Kauffman (925) 422-0419.
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